

(12)

(21) **2 459 062**

(51) Int. Cl.⁷: **B01D 29/66, B01D 24/46**

(22) **28.08.2002**

(85) **27.02.2004**

(86) **PCT/DE02/003163**

(87) **WO03/024560**

(30) **101 42 092.7 DE 30.08.2001**

(71) **OASE WUEBKER GMBH & CO. KG.,
Tecklenburger Strasse 161
48477, HORSTEL, XX (DE).**

(72) **HOFFMEIER, DIETER (DE).**

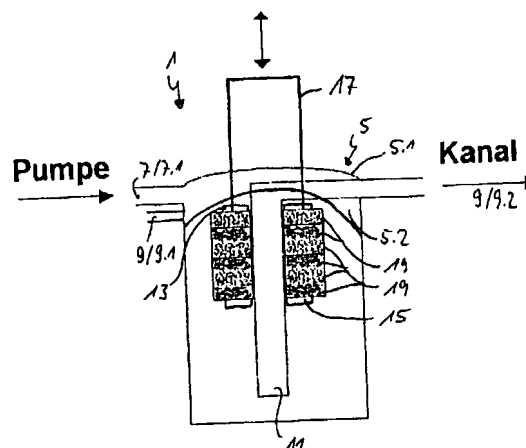
(74) **FETHERSTONHAUGH & CO.**

(54) **DISPOSITIF DE FILTRAGE POUR PLAN D'EAU DE JARDIN OU ANALOGUE**

(54) **FILTER DEVICE FOR GARDEN PONDS OR SIMILAR**

(57)

A filter device for filtering flowing liquids comprises a compressible filter medium in a container and a device with which said medium may be compressed using an operating handle so that contaminants can be squeezed from the filter medium. Furthermore a multi-valve is provided in the filter device, which can be adjusted to perform filtering, back-flushing and flushing by means of three flow paths. It is also possible to provide the filtration device exclusively with a multi-valve or a compressing device.





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CA 2459062 A1 2003/03/27

(21) **2 459 062**

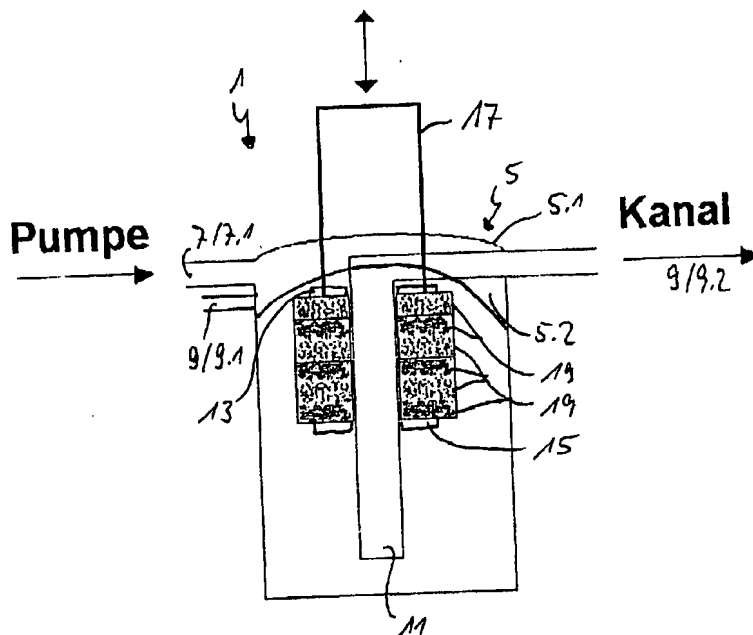
(12) **DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION**

(13) **A1**

(86) Date de dépôt PCT/PCT Filing Date: 2002/08/28
(87) Date publication PCT/PCT Publication Date: 2003/03/27
(85) Entrée phase nationale/National Entry: 2004/02/27
(86) N° demande PCT/PCT Application No.: DE 2002/003163
(87) N° publication PCT/PCT Publication No.: 2003/024560
(30) Priorité/Priority: 2001/08/30 (101 42 092.7) DE

(51) Cl.Int.⁷/Int.Cl.⁷ B01D 29/66, B01D 24/46
(71) Demandeur/Applicant:
OASE WUEBKER GMBH & CO. KG., DE
(72) Inventeur/Inventor:
HOFFMEIER, DIETER, DE
(74) Agent: FETHERSTONHAUGH & CO.

(54) Titre : DISPOSITIF DE FILTRAGE POUR PLAN D'EAU DE JARDIN OU ANALOGUE
(54) Title: FILTER DEVICE FOR GARDEN PONDS OR SIMILAR



(57) Abrégé/Abstract:

A filter device for filtering flowing liquids comprises a compressible filter medium in a container and a device with which said medium may be compressed using an operating handle so that contaminants can be squeezed from the filter medium. Furthermore a multi-valve is provided in the filter device, which can be adjusted to perform filtering, back-flushing and flushing by means of three flow paths. It is also possible to provide the filtration device exclusively with a multi-valve or a compressing device.

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Abstract

A filter device for filtering flowing liquids comprises a compressible filter medium in a vessel and a device by which the filter medium can be compressed by means of an actuation handle, so that impurities can be pressed out of the filter medium. In addition, the filter device contains a multipath regulator which can be adjusted for filtering, back-rinsing and clear-rinsing by means of three flow paths. It is also possible for the filter device to be outfitted exclusively with a multipath regulator or a compressing device.

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FILTER DEVICE FOR GARDEN PONDS OR SIMILAR

The present invention is directed to a filter device for filtering flowing liquids with a vessel and a compressible filter medium which is arranged in the vessel along a central flow channel or conduit and which is arranged between an inlet area and an outlet area in the main flow direction, and with a vessel cover in which the inlet area and the outlet area are integrated.

A filter device of the type mentioned above is known in general from the prior art. Filter devices of this type have the disadvantage that they are difficult to clean. The filter devices are used in ponds to filter suspended matter out of the pond water. Therefore, the filter medium becomes stopped up with impurities over time, so that it is necessary to clean the filter medium. In order to clean the filter medium in prior art filter devices, it is necessary to disassemble the filter device and to clean the filter medium while it is removed from the filter device.

This process is time-consuming, complicated and can also result in damage to the filter device and filter medium.

Therefore, it is the object of the present invention to provide a filter device of the type mentioned above which is simple to clean and does not need to be disassembled for the purpose of cleaning.

This object is met according to claim 1 in that the central flow conduit is constructed with a first holding surface for the filter medium upstream and with a second holding surface for the filter medium downstream, wherein the first holding surface and the second holding surface are in operative connection with one another by means of an actuating element in such a way that the relative distance between the two holding surfaces can be varied.

With the present invention, it is now possible to compress and decompress the filter medium in its working position when needed by changing the distance between the holding surfaces. By compressing, impurities in the filter medium are pressed out along with the liquid present in the filter medium and enter the central flow conduit.

The distance between the two holding surfaces can be reduced selectively by pressing the upper holding surface in the direction of the lower holding surface or by pulling the lower holding surface in the direction of the upper holding surface.

Further advantageous features of the present invention are indicated in subclaims 2 to 6.

The cleaning of the filter device according to the invention by compressing the filter medium is advantageously supported by a multifunction regulator according to one of claims 7 to 12. In the positions according to claim 8, the multifunction regulator makes it possible for the flowing medium to flow on three flow paths through the filter device. The normal main flow path allows filtering of the flowing medium, a second flow path allows back-rinsing of the filter device and a third flow path allows clear-rinsing of the filter device. In addition, the arrangement of the multifunction regulator in the vessel cover of the filter device allows the multifunction regulator to be manufactured with tolerances because possible small leaks occur in the interior of the vessel due to dimensional tolerances and do not present any disadvantages to be prevented. In addition, costly pipe laying can be dispensed with due to the flow paths in the vessel cover.

The above-stated object is further met according to claim 13 in that the outlet area has a first runoff opening to a pond and a second runoff opening to a conduit and in that a multidirectional or multipath regulator is arranged in the vessel cover and is selectively displaceable in such a way that three flow paths can be adjusted:

1. Main filtering flow path: inlet area, filter medium, first runoff opening to the pond;
2. Back-rinsing flow path: inlet area, second runoff opening to the conduit;
3. Clear-rinsing flow path: inlet area, filter medium, second runoff opening to the conduit.

An embodiment form of the present invention will be described more fully in the following with reference to the drawings.

Fig. 1 is a schematic side view in partial section showing a filter device according to the invention in which the flow paths are shown;

Fig. 2 is a schematic view of the filter device in Fig. 1, wherein an actuating element is actuated for decreasing the distance between two holding surfaces;

Figs. 3a, 3b and 3c show schematic top views of a multifunction regulator according to the present invention in three different positions.

A filter device 1 comprises a vessel 3 and a vessel cover 5. An inlet area 7 and an outlet area 9 are formed in the vessel cover 5. The outlet area 9 comprises a first runoff opening 9.1 to a pond and a second runoff opening 9.2 to a conduit. The inlet area 7 comprises an inlet opening

7.1 which is connected to a pump by a hose, a line or the like and by which, e.g., the pond water to be filtered can be pumped into the filter device 1. A central flow conduit 11 is formed as a filter connection piece in the vessel 3, i.e., the circumference of the filter connection piece is slotted, perforated or the like.

In the vicinity of the vessel cover 5, that is, at the top in Fig. 1, an upper, first holding surface 13 is arranged in a stationary manner at the central flow conduit 11 upstream. At the bottom, that is, at a downstream end of the central flow conduit 11, a lower, second holding surface 15 is arranged in such a way that it can slide along the circumference of the central flow conduit 11. An actuating element 17 is fixedly connected to the lower holding surface 15 and is guided at the upper holding surface 13 and guided outward through the vessel cover 5. By actuating the actuating element 17 (see Fig. 2), the lower, second holding surface 15 can be pulled along the central flow conduit 11 in the direction of the first holding surface 13, so that the distance between the two holding surfaces 13, 15 is reduced. In this way, a filter medium 19 which is arranged concentric to the central flow conduit 11 and between the holding surfaces 13 and 15 is compressed. The filter medium 19 is, e.g., an open-cell material which is suitable for filter functions and is compressible, e.g., a natural or synthetic cellular material.

In another embodiment form, the upper, first holding surface 13 can also be arranged so as to be longitudinally displaceable at the circumference of the central flow conduit 11 and the lower, second holding surface 15 is fixedly arranged at the circumference of the central flow conduit 11. In this case, the actuating element 17 is then also fixedly connected to the upper, first holding surface 13, so that the first, upper holding surface 13 can be pushed in the direction of the lower, second holding surface 15 by actuating the actuating element 17.

In other embodiment forms, it is conceivable that the first holding surface 13 is formed by the vessel cover 5 in case of actuation by pulling and that the second holding surface 15 is formed by the vessel bottom in case of actuation by pushing.

The vessel cover 5 has an upper cover 5.1 and a lower cover 5.2. A multipath regulator 21 (Fig. 3) is arranged in the lower cover 5.2. The multipath regulator 21 serves for selective adjustment of three flow paths. For this purpose, flow conduits (not shown) are also formed in the lower cover 5.2. In other embodiment forms, the multipath regulator 21 and the flow conduits can also be constructed in the upper cover 5.1.

In a first position of the multipath regulator 21 (Fig. 3a), a main flow path is adjusted by which a liquid to be filtered is guided back to its starting point, e.g., pond water is guided back into a pond, through the first runoff opening 9.1 after filtering. In Fig. 3b, a second flow path is adjusted in which a flowing medium is directed via the second runoff opening 9.2 into a conduit. This position is used for back-rinsing the filter device 1. In Fig. 3c a third flow path is adjusted in which a flowing medium is likewise directed through the second runoff opening 9.2 into a conduit. This flow path is used for clear-rinsing the filter device 1.

The installation of the multipath regulator 21 in the vessel cover 5 allows a certain leakage to occur in the multipath regulator 21 which comprises cock taps. This leakage remains in the vessel 3 and reaches the first or second runoff opening 9.1, 9.2 by one of the plurality of paths.

The vessel 3 has an inner wall 3.1, the filter medium 17 is disposed at a distance therefrom. Therefore, a flow conduit 23 is formed between the filter medium 17 and the inner wall 3.1. This flow conduit 23 extends along the entire height of the filter medium 17 and runs concentric to the central flow conduit 11.

In an alternative embodiment form, the cleaning can be carried out chiefly through actuation of the multipath regulator 21 and can be supported through the holding surfaces 13, 15 and the actuating element 17. This is expressed in claims 11 to 19.

Patent Claims

1. Filter device for filtering flowing liquids with a vessel and a compressible filter medium which is arranged in the vessel along a central flow conduit and which is arranged between an inlet area and an outlet area in the main flow direction, and with a vessel cover in which the inlet area and the outlet area are integrated, characterized in that the central flow conduit (11) is constructed upstream with a first holding surface (13) for the filter medium (19) and downstream with a second holding surface (15) for the filter medium (19), wherein the first holding surface (13) and the second holding surface (15) are in operative connection with one another by means of an actuating element in such a way that the relative distance between the two holding surfaces (13, 15) can be varied.

2. Filter device according to claim 1 characterized in that a flow conduit (1) which completely encloses the filter medium (19) is formed between an inner wall of the vessel (3) and the filter medium (19) concentric to the flow conduit (11).

3. Filter device according to claim 1 or 2, characterized in that the actuating element (17) is a pull element which is fixed to the second holding surface (15) and guided at the first holding surface (13).

4. Filter device according to claim 3, characterized in that the second holding surface (15) is arranged in such a way that it can slide at the central flow conduit (11).

5. Filter device according to one of claims 1 to 4, characterized in that the central flow conduit (11) is a filter connection piece.

6. Filter device according to one of the preceding claims, characterized in that the outlet area has a first runoff opening (9.1) to a pond and a second runoff opening (9.2) to a conduit.

7. Filter device according to claim 6, characterized in that a multipath regulator (21) is arranged in the vessel cover (5) and is selectively displaceable in such a way that three flow paths can be adjusted:

1. main filtering flow path: inlet area (7), filter medium (19), first runoff opening (9.1) to the pond;
2. back-rinsing flow path: inlet area (7), second runoff opening (9.1) to the conduit;
3. back-rinsing flow path: inlet area (7), filter medium (19), second runoff opening (9.2) to the conduit.

8. Filter device according to claim 6 or 7, characterized in that the multipath regulator (21) comprises a cock tap.

9. Filter device according to one of the preceding claims, characterized in that the vessel cover (5) has an upper cover (5.1) and a lower cover (5.2) and is constructed with flow conduits to the first and second runoff opening (9.1, 9.2).

10. Filter device according to claim 9, characterized in that the multipath regulator (21) is arranged in the lower cover (5.2) or upper cover (5.1).

11. Filter device according to one of the preceding claims, characterized in that the first holding surface (13) is the vessel cover (5).

12. Filter device according to one of the preceding claims, characterized in that the second holding surface (15) is a vessel bottom.

13. Filter device for filtering flowing liquids with a vessel and a compressible filter medium which is arranged in the vessel along a central flow conduit and which is arranged between an inlet area and an outlet area in the main flow direction, and with a vessel cover in which the inlet area and the outlet area are integrated, characterized in that the outlet area has a first runoff opening (9.1) to a pond and a second runoff opening (9.2) to a conduit, and in that a

multipath regulator (19) is arranged in the vessel cover (5) and is selectively displaceable in such a way that three flow paths can be adjusted:

1. main filtering flow path: inlet area (7), filter medium (19), first runoff opening (9.1) to the pond;
2. back-rinsing flow path: inlet area (7), second runoff opening (9.1) to the conduit;
3. clear-rinsing flow path: inlet area (7), filter medium (19), second runoff opening (9.2) to the conduit.

14. Filter device according to claim 13, characterized in that the multipath regulator (21) comprises a cock tap.

15. Filter device according to claim 13 or 14, characterized in that the vessel cover (5) has an upper cover (5.1) and a lower cover (5.2).

16. Filter device according to claim 15, characterized in that the multipath regulator (21) is arranged in the lower cover (5.2).

17. Filter device according to one of claims 13 to 16, characterized in that the central flow conduit (11) is constructed upstream with a first holding surface (13) for the filter medium (19) and downstream with a second holding surface (15) for the filter medium (19), wherein the first holding surface (13) and the second holding surface (15) are in operative connection with one another by means of an actuating element in such a way that the relative distance between the two holding surfaces (13, 15) can be varied.

18. Filter device according to one of claims 13 to 17, characterized in that a flow conduit () which completely encloses the filter medium (19) is formed between an inner wall of the vessel (3) and the filter medium (19) concentric to the flow conduit (11).

19. Filter device according to one of claims 13 to 18, characterized in that the actuating element (17) is a pull element which is fixed to the second holding surface (15) and guided at the first holding surface (13).

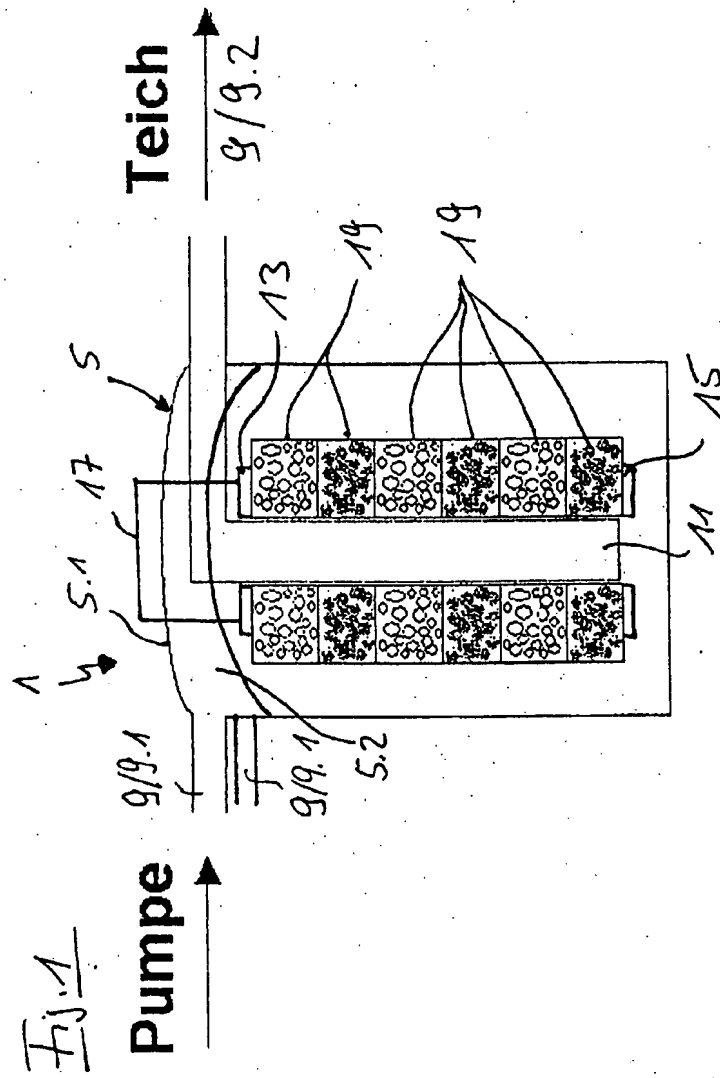
20. Filter device according to one of claims 13 to 19, characterized in that the second holding surface (15) is arranged in such a way that it can slide at the central flow conduit (11).

21. Filter device according to one of claims 13 to 20, characterized in that the central flow conduit (11) is a filter connection piece.

22. Filter device according to one of claims 17 to 21, characterized in that the first holding surface (13) is the vessel cover (5).

23. Filter device according to one of claims 17 to 22, characterized in that the second holding surface (15) is a vessel bottom.

**Patent Agents
Fetherstonhaugh & Co.**



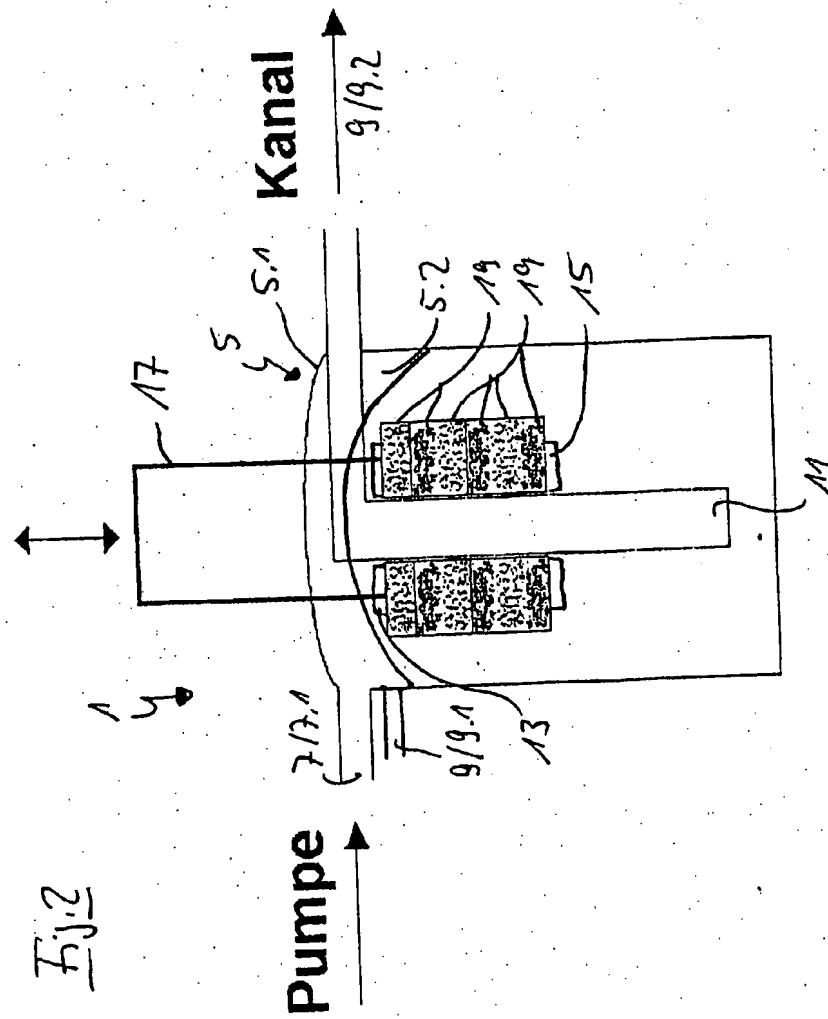


Fig. 3a

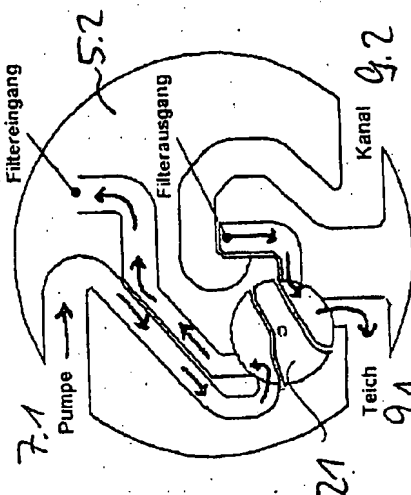


Fig. 3b

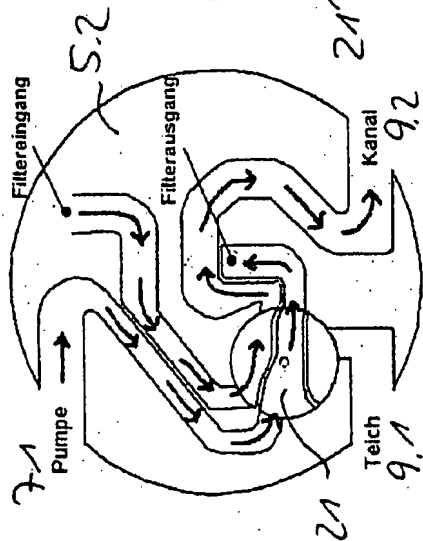


Fig. 3c

